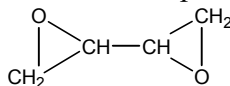


**DIEPOXYBUTANE**  
**CAS No. 1464-53-5**

First Listed in the *Third Annual Report on Carcinogens*



## CARCINOGENICITY

Diepoxybutane is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC S.4, 1982). Two forms of 1,2:3,4-diepoxybutane (*D,L*- and *meso*-) applied dermally, induced skin papillomas and squamous cell carcinomas in mice. The *D,L*-racemic mixture also induced local fibrosarcomas in female mice and female rats by subcutaneous injection. When administered by intraperitoneal injection, *L*-diepoxybutane increased the incidence of lung tumors in mice of both sexes (IARC V.11, 1976).

There are no adequate data available to evaluate the carcinogenicity of diepoxybutane in humans (IARC V.11, 1976).

## PROPERTIES

Diepoxybutane is a colorless liquid that is miscible with water, in which it undergoes hydrolysis. When heated to decomposition, it emits acrid smoke and irritating fumes. Diepoxybutane is available commercially as a mixed stereoisomer, including *D,L*-1,2:3,4-diepoxybutane (CAS No. 298-18-0), *D*-1,2:3,4-diepoxybutane (30419-67-1), *L*-1,2:3,4-diepoxybutane (30031-64-2), and *meso*-1,2:3,4-diepoxybutane (564-00-1).

## USE

Diepoxybutane is a highly reactive industrial chemical that has been used in research and experimental work, as a curing agent for polymers, as a cross-linking agent for textile fabrics, and in preventing microbial spoilage. Mixed stereoisomers and individual isomers of diepoxybutane have been used commercially to synthesize erythritol and other pharmaceuticals (IARC V.11, 1975).

## PRODUCTION

Diepoxybutane has not been produced commercially in the United States since 1978 (SRI, 1978; HSDB, 1998). Current sources (i.e., *Chemycyclopedia 98* and the 1998 *Chemical Buyers Directory*) indicate no suppliers of the chemical (Rodnan, 1997; Tilton, 1997). The 1979 TSCA Inventory indicated that 500 lb of diepoxybutane (isomeric forms not specified) were imported by one company in 1977 (TSCA, 1979). No export data were available.

## EXPOSURE

The primary routes of potential human exposure to diepoxybutane are inhalation and dermal contact. Potential occupational exposure to residues of diepoxybutane occurred during the manufacture of fabrics, pharmaceuticals, and polymers and during the use of the compound in research. A risk of exposure also existed for workers and health professionals involved in the formulation, packaging, and administration of pharmaceuticals synthesized from diepoxybutane. The National Occupational Exposure Survey (conducted by NIOSH from 1981 to 1983) and the National Occupational Hazard Survey (conducted by NIOSH from 1972 to 1974) made no estimate of possible worker exposure to the chemical. Use of diepoxybutane in consumer products is not known. Possible consumer exposure to residues of diepoxybutane may have occurred through use of textiles or related polymer products containing it.

## REGULATIONS

EPA regulates diepoxybutane under the Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Superfund Amendments and Reauthorization Act (SARA), and Toxic Substances Control Act (TSCA). Under TSCA, EPA requires manufacturers of diepoxybutane to provide detailed production and marketing data. Health and safety study data requirements have also been designated. RCRA designates diepoxybutane as a hazardous constituent of waste. Additionally, CERCLA established a reportable quantity (RQ) of 10 lb, and SARA established notification and reporting requirements for diepoxybutane. OSHA regulates diepoxybutane under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-44.